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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,719	09/27/2001	Tatsuya Miyatani	S004-4403	6392

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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/966,719

Applicant(s)

MIYATANI ET AL.

Examiner

Phillip A Johnston

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment dated 15 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Examiners Response to Arguments

1. Applicants arguments are moot in view of new grounds for rejection.

Claims Rejection – 35 U.S.C. 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-17 as amended, and newly added Claims 18-36 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,543,614, to Miyamoto.

Miyamoto (614) discloses a scanning probe microscope having a probe for scanning a sample, a piezoelectric unit finely movable in the X, Y and Z directions, and a probe control unit for controlling a fine movement amount of the piezoelectric unit in the Z direction in accordance with a detected interaction between the sample and the probe. A driving unit applies a continuously changing voltage to the piezoelectric unit to drive the piezoelectric unit in one of an X and Y direction to scan along a scan line,

a displacement detection unit detects the displacement of the piezoelectric unit along the scan line, and a matching detection unit outputs a coincidence detection signal when the detected displacement of the piezoelectric unit along the scan line coincides with target displacement values corresponding to desired measurement points, as recited in Claims 1, and 25. A surface data acquiring unit acquires sample surface data based on the Z-directional fine movement amount of the piezoelectric unit each time the matching detection unit outputs a coincidence detection signal. See Abstract.

It is implied herein that the use of a piezoelectric unit finely movable in the X, Y and Z directions in accordance with Miyamoto (614) is equivalent to the xyz translator, as recited in newly added Claim 18.

Miyamoto (614) also discloses an analog input terminal of an A/D converter 21 is connected to an output terminal of an X-directional displacement sensor 13, and an analog input terminal of an A/D converter 22 is connected to an output terminal of a Y-directional displacement sensor 14. The A/D converter 21 converts an X-directional displacement detection signal P_x into an X-directional detection data item D5 expressed in predetermined bits. The A/D converter 22 converts a Y-directional displacement detection signal P_y output from the displacement sensor 14, into a Y-directional displacement detection data item D6. A microcomputer 20 is connected to the digital output terminals of the A/D converters 21 and 22. The microcomputer 20 comprise a ROM for storing measurement sequence programs shown in FIGS. 2A, 2B and FIG. 3 in flowcharts, a timer 23 for periodically generating an interruption process shown in FIG. 3, various types of registers 24 for storing data items acquired or

generated in a measurement sequence, and flags 25 showing a scanning state. The X-directional target register 31 stores an X-directional displacement target data item D11 from an X-directional target setting unit 44. The Y-directional target register 32 stores an Y-directional displacement target data item D22 from a Y-directional target setting unit 45. See Column 4, line 55-67; Column 5, lines 1-7, and 19-23.

Miyamoto (614) further discloses that the measurement of the surface shape of the sample 1 starts in the state where the tip end of the cantilever (probe) 2 is situated at the leading end of the first scan line, as recited in Claim 10. The X- and Y-directional displacement data items D5 and D6 of the leading point of the first scan line are initially set to the first X-directional displacement register 33 and the first Y-directional displacement register 35. Also in the processes of steps S4 to step S11, the voltage of the X-directional scan signal S_x increases at a constant rate from the scan starting point until the number of measurement points, n , becomes $n=8$. After that, until the number of measurement points, n , becomes $n=8$ once again, the voltage is decreased at a constant rate. Therefore, a waveform of the angled shape shown in FIG. 5 (ii) is obtained. See Column 6, line 8-14; and Column 7, line 33-40.

Miyamoto (614) still further discloses In the SPM shown in FIG. 10, the position of the probe in the Z direction is adjusted as a probe control unit 6 controls the voltage value of a scanning signal S_z applied to the cylindrical piezoelectric unit 4, the displacement of the probe in the X direction is adjusted as a feedback drive circuit 7 controls the voltage value of a drive signal S_z applied to the cylindrical piezoelectric

unit 4, and the displacement of the probe in the Y direction is adjusted as a feedback drive circuit 8 controls the voltage value of a drive signal D_y applied to the cylindrical piezoelectric unit 4. The instruction for scanning in the X and Y directions is supplied from a microcomputer 9 to the feedback drive circuits 7 and 8. In the case where the probe is moved in the X direction, the microcomputer 9 sends a scanning instruction signal D_1 , which linearly increases or decreases at a predetermined angle, to the feedback drive circuit 7. In the case where the probe is moved in the Y direction, the microcomputer 9 sends a scanning instruction signal D_2 , which linearly increases or decreases at a predetermined angle, to the feedback drive circuit 8. The feedback drive circuit 7 and 8 receive displacement detection signals from the X-directional displacement sensor 10 and the Y-directional displacement sensor 11 at a predetermined cycle, and drive signals D_x and D_y are subjected to the feedback control so that the waveform of the displacement detection signal becomes the same as that of the scan instruction signal. Meanwhile, the Z-directional distance between the sample 1 and the probe 2 is detected by a probe displacement detection unit 15 at all times. For example, the Z-directional displacement of the probe 2 is detected by the known optical lever method, and a displacement detection signal P_z is input to the probe control unit 6. The probe control unit 6 controls the voltage value of a scan signal S_z so that the probe is at a target Z position when the displacement detection signal P_z varies. Further, in response to a request from the microcomputer 9, a Z position control data D_3 (corresponding to scan signal S_z) formed by the probe control unit 6 is supplied to the microcomputer 9, and image data D_4 obtained by converting

the Z position control data D3 into sample surface data is sent from the microcomputer 9 to the host computer 16. Thus, the sample surface image is displaced on the screen of the host computer 16. Thus, the distortion of the sample surface data image, which is caused by the hysteretic relationship between the applied voltage to the piezoelectric unit and the displacement is removed, and an image having a high linearity is obtained by a host computer. See Column 1, line 42-62; and Column 2, line 10-38.

It is implied herein that the detected displacement in the X and Y scanning directions in accordance with Miyamoto (614) is equivalent to providing feedback control relative to the scanning frequency of the scanning axis, as recited in Claims 4,5,7,8,10-12,14,and 16.

Conclusion

4. The Amendment filed on 4-15-2003 has been considered but the arguments are moot in view of new grounds for rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip A Johnston whose telephone number is 305 7022. The examiner can normally be reached on 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ

June 11, 2003



JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2881